December 2004

Improving the Quality of Drug Management

of Saskatchewan Seniors in Long-Term Care

Key messages

- Medication management for seniors can be challenging, because they often need more drug therapy than the rest of the population and because, as people get older, drugs can have a more pronounced effect on them.
- In 2001, 28 per cent of seniors living in long-term care (LTC) in Saskatchewan regularly received at least one medication with a high risk of adverse side effects, as defined by the Beers criteria. Adverse side effects include dizziness, confusion, falls, and disability. These medications could potentially be avoided, through substitution with other medications.
- Twenty-one per cent of elderly LTC residents were regularly dispensed one or more benzodiazepines, and almost one-quarter of these residents received doses exceeding the recommended maximum. Benzodiazepines are used mainly for anxiety and insomnia, and have been shown to increase the risk of falls in seniors.
- Sixty-four per cent of residents on an NSAID received appropriate therapy to prevent gastrointestinal problems. This puts Saskatchewan on par with other jurisdictions.
- Saskatchewan has an opportunity to be a leader for Canada in developing quality improvement programs for drug management of long-term care residents.

Why look at quality of drug treatment for elderly long-term care residents?

Drug management is an important quality of care issue for seniors. The elderly usually take more medications than the rest of the population, and as people get older, the way their bodies process drugs can change. As a result, seniors may become more sensitive to certain drugs.

Studies from outside Saskatchewan show that many seniors are often prescribed medications that have a high risk of adverse side effects, such as increased confusion, dizziness, low blood pressure, falls, and in rare instances, death. Furthermore, such medications could potentially be avoided, through substitution with other drugs. One Ontario study, for example, found that 21 per cent of elderly special care home residents were prescribed at least one high-risk, potentially avoidable drug. Because drug management can contribute significantly to quality of life for seniors in long-term care, we wanted to assess the situation in Saskatchewan.

How did we assess the quality of care?

For a detailed explanation of methodology, see our Technical Appendix. This document is available online at www.hqc.sk.ca.

Working with an expert advisory group of 10 individuals with experience in pharmacology and geriatric medicine, we developed a list of evidence-based indicators of drug management quality. The list was based on a review of the literature and adapted to Saskatchewan's population and unique needs. Using administrative data, we examined what drugs Saskatchewan's long-term care residents were dispensed, in what dosages, and in what combinations. Our review focused on process measures, that is, whether or not individuals were dispensed drugs that could potentially put them at risk for adverse events.

Continued inside...

HEALTH QUALITY COUNCIL

Patient story

In 2001, Jock McNeill faced a challenge that many other families have – the need to place a parent in a special care home. Jock's mother, Donell McNeill – a lively and independent woman throughout most of her life – had recently begun experiencing bouts of depression and paranoia. A former nurse, Donell had enjoyed good health well into her early 90s, living on her own in an apartment in the Battlefords.

"Mother was an independent soul," says McNeill. "She didn't like playing bingo or any of those things. She had a clear mind, she was sharp, and was pretty physical. She had a knee replaced when she was in her 80s, but other than that her health was pretty good."

While at home alone one day, the 94-year-old began feeling dizzy and fell, injuring herself. Dazed and bleeding, she managed to call her son, who soon arrived to help her. After that incident, the family realized she needed more support and encouraged her to enter River Heights Lodge. They were concerned not only about her mental health, but also about her drug management and wondered if it had been a factor in her fall.

The River Heights team reviewed her health and current medications, and developed a care plan to address Donell's recent mental health issues. The focus was on finding a balance between reducing her anxiety, without over-sedating her. That first meeting was reassuring for the family.

"Mother was included at the meeting," recalls Jock. "They surveyed her on a lot of things, asking her how she felt about things. They asked her what she had to say, which I thought was wonderful."

Throughout their mother's residency at the Lodge, the McNeill family felt welcome to communicate their observations to the team, so that any concerns would be acted upon promptly. Jock was always impressed with the respect the River Heights team had for his mother.

Donell McNeill has since passed away, but the family remains grateful for the care she received at the end of her life. During her time at the River Heights Lodge, they had peace of mind that she was receiving the best possible care–including management of her medication.

"This program is really a step forward, a wonderful idea," says Jock. "I would endorse any other family to be part of this kind of program, if they have the good fortune to do it. You're involved, you feel like you're part of the care. It's really an excellent program. I have nothing but good things to say about it. I felt very comfortable in that place. I have a lot of respect for what those people are doing."

Jock's positive experience with the team at River Heights Lodge made such an impact that he has switched pharmacists. He now goes to Melinda Franklin to have his prescriptions filled. It's yet another example of how an interdisciplinary team can improve care beyond the facility setting and into the community.

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We highlight three key indicators of interest in this summary report:

1. *Were residents being dispensed high-risk, potentially avoidable medications?* We used the "Beers criteria," a list developed by international experts, to identify drugs that could cause serious adverse side effects in the elderly and could potentially be avoided through substitution with other medications (See Table 1).
2. *Were steps taken to prevent gastrointestinal bleeding among patients who were prescribed non-steroidal anti-inflammatory drugs (NSAIDs)?* NSAIDs are used frequently in seniors for arthritis. An important side effect of NSAIDs is gastrointestinal bleeding. This can be prevented, either by taking an additional "GI protectant" medication with the NSAID, or using a special type of NSAID known as a coxib.
3. *Are residents on benzodiazepines?* These medications are central nervous system depressants used mainly for anxiety and insomnia, and, less frequently, for seizures. Although not necessarily inappropriate, their use has been associated with falls, confusion and delirium in the elderly and so they must be used with caution or avoided if possible. Furthermore, the risks of side effects increase significantly with higher dosages. (Note that this indicator overlaps with the Beers criteria in that the Beers list includes long-acting benzodiazepines and short-acting benzodiazepines in instances where they are prescribed above the recommended daily dose.)

Our population included individuals who were residents in Saskatchewan long-term care facilities from October 2, 2000 to December 31, 2001. To be included in the study, individuals had to be:

- residents of long-term care as of January 1, 2001, with at least 90 consecutive days of residency prior to this date. This 90-day stabilization period allowed health care providers to modify a resident's drug therapy after being admitted to the facility.
- residents of long-term care as of December 31, 2001.
- sixty-five years of age or older at any point in the study year.

Residents were excluded from the study if they:

- did not have valid Saskatchewan Health insurance coverage throughout the study period;
- were hospitalized more than 35 consecutive days during the study period, or discharged from long-term care for more than 35 days during the study; or,
- were Registered Indians. Because the federal government provides health coverage, their dispensing data were not captured in the provincial health database.

We used several Saskatchewan Health databases for this study: Saskatchewan Institutional Supportive Care System, Person Registry Database, Hospital File, Prescription Drug Plan Historical Claims Datasets, and Prescription Drug Plan "Alldin" Datasets.

Recommended citation format: L Clatney, BTB Chan, D Jorgenson, S Furniss, L Gander. Improving the Quality of Drug Management of Saskatchewan Seniors in Long-Term Care. Saskatoon: Health Quality Council. December 2004.

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How are we doing in Saskatchewan?

For more detailed information on results, see the full Research Report (www.hqc.sk.ca).

- In 2001, 28 per cent of LTC residents in Saskatchewan regularly received one or more high-risk, potentially avoidable drugs, as defined by the Beers list. There were some significant differences among health regions; dispensing rates varied from 24.1 per cent to 35.2 per cent. Of those residents dispensed a drug on the Beers list, 16 per cent were regularly dispensed two or more of these medications. Again, there was significant regional variation; the lowest dispensing rate was 6.9 per cent and the highest was 28.2 per cent.
- Sixty-four per cent of residents on an NSAID also received a GI protectant. Saskatchewan is on par with other jurisdictions for this indicator.
- Twenty-one per cent of residents were regularly dispensed benzodiazepines. Of those residents dispensed benzodiazepines, almost 25 per cent were dispensed doses in excess of the recommended amount.

What were the limitations of this study?

- The study does not address *under*prescribing in the elderly population. Many beneficial medications are not prescribed as commonly as they should be, but we do not know to what extent underprescribing is happening in Saskatchewan.
- The data we used did not include most over-the-counter medications, such as vitamins and supplements.
- Without knowing the individual clinical situation in which medications were dispensed, we could not definitively assess whether the therapy was appropriate or inappropriate for each client.
- The most recent data we analyzed were from 2001; they may not necessarily reflect current dispensing trends.

What do our findings mean?

There is opportunity for improvement in Saskatchewan

Most residents on an NSAID are taking at least one drug to prevent gastrointestinal bleeding. This finding is encouraging. However, there are no established benchmarks for a reasonable rate of use of these drugs to prevent complications in this population. Drug reviews in the future could assess the appropriate use of these medications and help set benchmarks for their use.

There appears to be room for improvement in the use of high-risk, potentially avoidable medications as defined by the Beers criteria. More than one in four LTC residents are on these drugs, and some residents are on more than one. Furthermore, the rate of dispensing for these drugs appears higher than some sites in Canada.

The reasons why residents were on these medications are not known. One possibility is that the medication may have been the best available drug at one point, but newer, safer medications may have been introduced into the market more recently. Unless the residents' drugs are reviewed regularly, these opportunities to improve care may be missed. Another possibility is that health care providers may feel pressure to increase the dose of some medications such as benzodiazepines to beyond the recommended maximum, if a resident's anxiety or insomnia appears to be uncontrolled. In such instances, the health care team may want to consider other non-pharmacological ways to help the resident feel more in control of his or her symptoms.

Next steps

Setting benchmarks for dispensing

Currently, no clearly defined benchmarks exist for use of Beers criteria drugs, benzodiazepines, or GI protectant use with NSAIDs. Administrative data alone cannot determine these benchmarks. We do know, however, that some sites in Ontario appear to have lower rates of use for Beers drugs. The Health Quality Council has consulted with our health care partners and stakeholders about this issue, and believes a good first step in quality improvement would be to reduce the dispensing of drugs on the Beers list by 25 per cent in the next year. Achieving this benchmark would reduce the percentage of Saskatchewan long-term care residents receiving inappropriate medication from 28 per cent to 20 per cent, and at least bring the dispensing rate to a level comparable to some other sites in the country.

The Health Quality Council will work with its stakeholders to develop true best practice benchmarks to set targets for improvement. This process will involve identifying sites that conduct regular, comprehensive reviews on their residents and have been able to achieve significant reductions in use of these high-risk medications. The rates of use at these best practice sites can then be used as guidelines for target improvement for other sites.

There is good evidence reported in the scientific literature about the benefits of interdisciplinary teams in long-term care settings. North Battleford's three long-term care centres illustrate the benefits of using such an interdisciplinary team (see "Ideas for Improvement").

The Health Quality Council will be launching an initiative, following this report, to establish interdisciplinary teams with pharmacist support in selected demonstration sites throughout Saskatchewan that currently do not use this model. The goal will be to select enough sites to offer the model to 500 residents and evaluate its impact on drug dispensing over time.

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Indicator	Comments (Beers Rationale)	Alternatives
Chlorpropamide (Diabinese)	It has prolonged half-life in elderly patients and could cause prolonged hypoglycemia. Additionally, it is the only oral hypoglycemic agent that causes SIADH.	Glyburide, glimepiride, gliclazide, or other non-sulfonylurea oral hypoglycemic agents.
Gastrointestinal antispasmodic drugs: dicyclomine (Bentyl) propantheline (Pro-banthine)	GI antispasmodic drugs are highly anticholinergic and have uncertain effectiveness. These drugs should be avoided (especially for long-term use)	Dependent on clinical scenario - consult GI or internal medicine if needed
Anticholinergics and antihistamines: hydroxyzine (Atarax)	All nonprescription and many prescription antihistamines may have potent anticholinergic properties. Non-anticholinergic antihistamines are preferred in elderly patients when treating allergic reactions.	Cetirizine (Reactine), fexofenadine (Allegra), loratadine (Claritin), desloratadine (Aerius)
All barbiturates (except Phenobarbital) except when used to control seizures = 1) amobarbital sodium, 2) pentobarbital sodium, and 3) secobarbital sodium	Are highly addictive and cause more adverse effects than most sedative or hypnotic drugs in elderly patients.	Non-drug measures for sleep, anxiety, behaviour. Drugs: Zaleplon (Starnoc), Zopiclone (Imovane), various benzodiazepines.
Meperidine (Demerol)	Not an effective oral analgesic in doses commonly used. May cause confusion and has many disadvantages relative to other narcotic drugs.	Morphine, codeine, topical fentanyl patches
Ticlopidine (Ticlid)	Has been shown to be no better than aspirin in preventing clotting and may be considerably more toxic. Safer, more effective alternatives exist.	ASA (Aspirin), clopidogrel (Plavix), Aggrenox, warfarin
Daily fluoxetine (Prozac)	Long half-life of drug and risk of producing excessive CNS stimulation, sleep disturbances, and increasing agitation. Safer alternatives exist.	Shorter acting SSRIs include: citalopram (Celexa), paroxetine (Paxil), sertraline (Zoloft)
Orphenadrine (Norflex)	Causes more sedation and anticholinergic adverse effects than safer alternatives.	Dependent on clinical scenario
Thioridazine (Mellaril)	Greater potential for CNS and extrapyramidal adverse effects.	Depends on clinical scenario -high-potency or atypical antipsychotics (haloperidol, risperidone, quetiapine olanzapine)
Mesoridazine (Serentil)	CNS and extrapyramidal adverse effects.	See thioridazine
Short acting nifedipine (Procardia and Adalat)	Potential for hypotension and constipation. 5 & 10 mg capsule (i.e., not sustained or extended release tablets)	Long acting nifedipine (Adalat XL), felodipine (Renedil), amlodipine (Norvasc)
Clonidine (Catapres)	Potential for orthostatic hypotension and CNS adverse effects.	Dependent on clinical scenario and comorbidities, but may include: thiazide diuretics, ACE-inhibitors, calcium channel blockers, beta-blockers, or angiotensin receptor blockers.
Cimetidine (Tagamet) - H2 blocker	CNS adverse effects including confusion.	Ranitidine (zantac) or others (dose may need to be decreased if reduced renal function)
Thyroid (Desiccated thyroid)	Concerns about cardiac effects. Safer alternatives available.	Levothyroxine (Eltroxin, Synthroid)
Estrogens only (oral)	Evidence of the carcinogenic (breast and endometrial cancer) potential of these agents and lack of cardioprotective effects in older women.	Depends on reason for use

In 1991 gerontologist Dr. Mark H. Beers developed a list of potentially avoidable, high-risk medications to be avoided in the elderly, based on the literature and consensus from a panel of experts. This list was subsequently updated in 1997, 2001, and most recently in 2003. We have used a modified version of the Beers list, based on Saskatchewan's formulary. The chart includes alternatives that are safer, yet equally effective.

About the BEERS criteria

In 1991 gerontologist Dr. Mark H. Beers developed a list of potentially avoidable, high-risk medications to be avoided in the elderly, based on the literature and consensus from a panel of experts. This list was subsequently updated in 1997, 2001, and most recently in 2003. We have used a modified version of the Beers list, based on Saskatchewan's formulary. The chart includes alternatives that are safer, yet equally effective.

Indicator	Comments (Beers Rationale)	Alternatives
Propoxyphene & combo products	Offers few analgesic advantages over acetaminophen, yet has the adverse effects of other narcotic drugs	Acetaminophen, various NSAIDs, acetaminophen with codeine, morphine
Indomethacin	Of all available nonsteroidal anti-inflammatory drugs, this drug produces the most CNS adverse effects	Other NSAIDs such as naproxen or ibuprofen
Pentazocine	Narcotic analgesic that causes more CNS adverse effects, including hallucinations and confusion, more commonly than other narcotic drugs. Additionally, it is a mixed agonist and antagonist.	Morphine, codeine, topical fentanyl patches
Amitriptyline	Because of its strong anticholinergic and sedation properties, amitriptyline is rarely the antidepressant choice for elderly patients	SSRIs (if treating depression), nortriptyline or desipramine (alternative TCAs with less anticholinergic effects) or gabapentin (for treating pain)
Doxepin	Because of its strong anticholinergic and sedation properties, doxepin is rarely the antidepressant choice for elderly patients	Same as list for amitriptyline
Flurazepam	This benzodiazepine hypnotic has an extremely long half-life in elderly patients (often days), producing prolonged sedation and increasing the incidence of falls and fracture. Shorter acting benzodiazepines are preferable.	Lorazepam, oxazepam, temazepam
Doses of short-acting/ultra short-acting benzodiazepines, doses greater than: lorazepam (3mg); oxazepam (60 mg); alprazolam (2 mg); temazepam (15 mg); and triazolam (.25 mg)	Because of increased sensitivity to benzodiazepines in elderly patients, smaller doses may be effective as well as safer. Total daily doses should rarely exceed the suggested maximums.	Try to slowly reduce dosage over time
Long-acting benzodiazepines: chlordiazepoxide (Librium) diazepam (Valium), clorazepate (Tranxene)	These drugs have a long half-life in elderly patients (often several days), producing prolonged sedation and increasing the risk of falls and fractures. Shorter acting benzodiazepines are preferred if a benzodiazepine is required.	Lorazepam, oxazepam, temazepam, clonazepam
Disopyramide (Norpace and Norpace CR)	Of all antiarrhythmic drugs, this is the most potent negative inotrope and therefore may induce heart failure in elderly patients. It is also strongly anticholinergic. Other antiarrhythmic drugs should be used	Depends highly on clinical scenario - consult cardiology or internal medicine if needed
Digoxin (Lanoxin) (should not generally exceed >0.125 mg/d)	Decreased renal clearance may lead to increased risk of toxic effects. In frail elderly, toxicity is also more likely with blood levels in upper therapeutic range	Consider periodic digoxin serum levels to ensure appropriateness of dosage as the patient ages (reduced renal clearance with age may necessitate periodic dosage reduction)
Methyldopa (Aldomet) and methyldopa-hydrochlorothiazide (Aldoril)	May cause bradycardia and exacerbate depression in elderly patients. Also greater risk of orthostatic hypotension.	Dependant on clinical scenario and comorbidities, but may include: thiazide diuretics, ACE-inhibitors, calcium channel blockers, beta-blockers, or angiotensin receptor blockers.

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Next Steps...
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Other ideas for improvement

Another program making a difference is the RxFiles. Started in the former Saskatoon health district, it has expanded to most major centres in the province, and also makes its information accessible anywhere in the world through its web site. This education outreach initiative, combined with decision-support tools such as newsletters and PDA downloads, has been shown to improve quality of drug management in Saskatchewan long-term care.

For more information on ideas for quality improvement, please refer to our Quality Improvement Guide. This document is available online at *www.hqc.sk.ca*.

Areas for further research

The focus of our review was on drug management in long-term care. However, this only gives us part of the picture. Many of our seniors do not live in special care homes but are still vulnerable to the same problems related to medication dispensing. The next phase of our study will be to examine drug management for seniors living in the community.

One theme that we heard repeatedly from quality improvement leaders was the sense of satisfaction they got from improving the quality of care for residents in LTC. Although seniors may have some very challenging medication needs, finding approaches that meet those needs is rewarding for the entire care team. They find inspiration in providing families with peace of mind, residents with better quality of life, and fellow providers with support and shared success.

Ideas for improvement

The three nursing homes in North Battleford are excellent examples of the benefits of an interdisciplinary approach to case management. At River Heights Lodge, Battlefords District Care Centre, and Villa Pascal, pharmacists, social workers, nurses, doctors, recreational aides, family members, and many others all work together to promote quality of care. Each team member interacts with the resident in a unique way, and has unique insights on how care might be improved. Pooling these insights together creates a more comprehensive view of the resident's needs.

In 2000, the Continuing Care Group for the Battlefords Health District decided to add a pharmacist to the team. They searched for someone who would be on-site part of the time to provide support to families and staff members. Melinda Franklin was one of the pharmacists who responded to the call. Before moving to North Battleford to work at Shopper's Drug Mart pharmacy, Franklin provided clinical services to two nursing homes in Assiniboia and had also been accredited in a geriatric program. Her background and experience made her an ideal candidate.

In North Battleford, the care plan begins with the admissions process, which includes the resident and his or her family. The care team reviews each resident's history, including current medications, then draws up a care plan for optimal medication. Any decisions about the care plan involve the resident and family. The plans are ongoing, and include annual conferences with family and residents to review care. Shopper's Drug Mart has two clinical pharmacists available to meet with the family at any point, to listen to concerns, explain medications, and educate the family.

Drug management, however, does not begin and end with the pharmacists. A key team member during the admissions process is the staff social worker. Moving to a nursing home is a major transition, and it can be difficult for many families. Often the family has concerns about medication they are not comfortable sharing with the pharmacist, such as drug costs. The social worker acts as a liaison between the resident and pharmacist, and allows the family to connect with someone in a non-medical role.

Recreational aides also contribute to optimal drug management, as they are in a unique position to observe residents' activity level. A sudden drop in participation may suggest that the resident is depressed, or is experiencing side effects from their medication. Nursing aides, because they tend to spend the most time with residents, notice things such as when residents have difficulty swallowing or are not taking their medications. The feedback from all the team members assists in adjusting and improving the care plan as needed.

"Nothing but good things have come out of this team approach," says Dr. Jim Johnson, a local physician who is part of the care team at River Heights. "The pharmacist comes around regularly now and leaves recommendations for the patients." Although some recommendations are not always implemented, Dr. Johnson appreciates the input. When asked if he has noticed any differences in his patients, Dr. Johnson said, "I can't pinpoint anything specific, but the overall care these people receive as far as medications go is definitely improved."

In North Battleford, the interdisciplinary approach has received high marks from both residents and staff. "We have had encouraging feedback from families and staff," says Kelly Day, Facility Manager for the River Heights Lodge. "It's so positive to have the support of everyone involved, and to know you can seek expertise from all members. The staff are reaching goals and they feel supported in doing it. Families have praise for how the team works together, with every member making a valuable contribution."

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Recreational aides also contribute to optimal drug management, as they are in a unique position to observe residents' activity level. A sudden drop in participation may suggest that the resident is depressed, or is experiencing side effects from their medication. Nursing aides, because they tend to spend the most time with residents, notice things such as when residents have difficulty swallowing or are not taking their medications. The feedback from all the team members assists in adjusting and improving the care plan as needed.

"Nothing but good things have come out of this team approach," says Dr. Jim Johnson, a local physician who is part of the care team at River Heights. "The pharmacist comes around regularly now and leaves recommendations for the patients." Although some recommendations are not always implemented, Dr. Johnson appreciates the input. When asked if he has noticed any differences in his patients, Dr. Johnson said, "I can't pinpoint anything specific, but the overall care these people receive as far as medications go is definitely improved."

In North Battleford, the interdisciplinary approach has received high marks from both residents and staff. "We have had encouraging feedback from families and staff," says Kelly Day, Facility Manager for the River Heights Lodge. "It's so positive to have the support of everyone involved, and to know you can seek expertise from all members. The staff are reaching goals and they feel supported in doing it. Families have praise for how the team works together, with every member making a valuable contribution."